PB-239 659

BAY OF NAPLES AND SEBAGO LAKE, CUMBERLAND COUNTY, MAINE

Pacific Northwest Environmental
Research Laboratory

Prepared for:

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Maine Department of Environmental
Protection

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT
ON

BAY OF NAPLES AND SEBAGO LAKE
CUMBERLAND COUNTY
MAINE

EPA REGION I

WORKING PAPER No. 5

WITH THE COOPERATION OF THE
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
AND THE
MAINE NATIONAL GUARD

MAY, 1974

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FOREWORD

The National Eutrophication Survey was initiated in 1972 as a research project in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations and impact on selected fresh water lakes as a basis for formulating comprehensive and coordinated national, regional and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations and impacts can, in fact, be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

This report documents the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin. It is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/ standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Maine Department of Environmental Protection for professional involvement and to the Maine National Guard for conduct of the tributary sampling phase of the Survey.

William R. Adams, Commissioner of the Department of Environmental Protection, and William P. Hinckley and Matthew Scott of the Division of Lakes and Biological Studies, provided invaluable lake documentation and counsel during the course of the study.

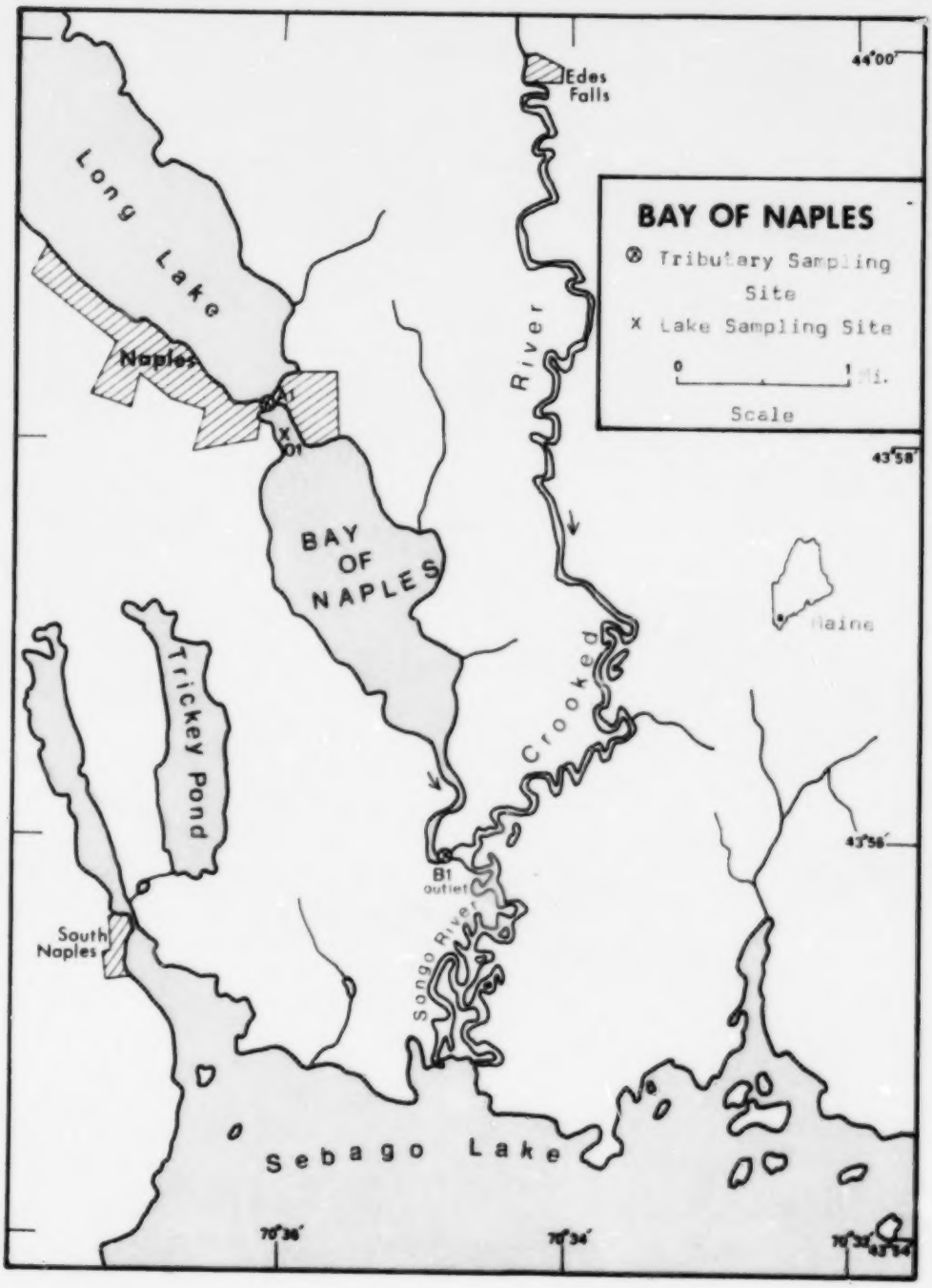
Major General Edwin W. Heywood (Retired), then the Adjutant General of Maine, and Project Officer Lieutenant Colonel Earl B. Adams who directed the volunteer efforts of the forty-one participating Maine National Guardsmen are also gratefully acknowledged for their assistance to the Survey.

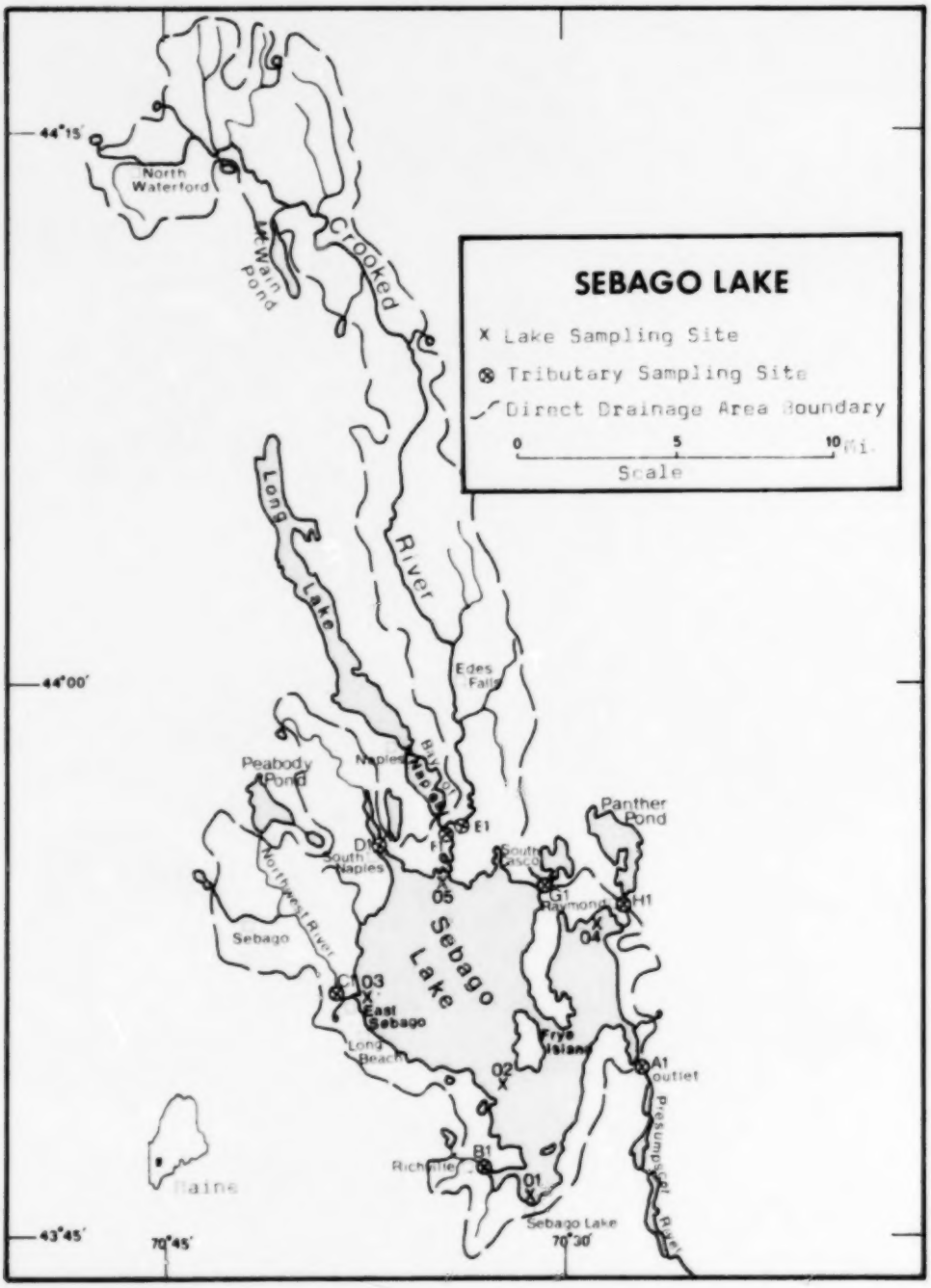
NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF MAINE

LAKE NAME	COUNTY
Moosehead Lake	Piscataquis, Somerset
Estes Lake	York
Long Lake	Cumberland
Bay of Naples & Sebago Lake	Cumberland
Rangeley Lake	Franklin
Long Lake	Aroostook
Mattawamkeag Lake	Aroostook
Sebasticook Lake	Penobscot


BAY OF NAPLES
Tributary Sampling Site
Lake Sampling Site
0
1 Mi.
Scale
Edes Falls
44°00'
Long Lake
Naples
River
B1
X
01
BAY OF NAPLES
43°58'
Maine
Crooked
Trickey Pond
43°56'
B1 outlet
Songo River
South Naples
Sebago Lake
70°36'
70°34'
70°32'
43°54'


SEBAGO LAKE
X Lake Sampling Site
⊗ Tributary Sampling Site
Direct Drainage Area Boundary
0 5 10 Mi.
Scale
44°15'
44°00'
43°45'
70°45'
70°30'
North Waterford
Crooked River
Long Lake
Edes Falls
Peabody Pond
Naples
Panther Pond
South Naples
South Casco
Raymond
Sebago
Northwest River
Sebago Lake
East Sebago
Long Beach
Frye Island
Outlet
Richville
Maine
Sebago Lake
Presumpscot River
C1
D1
E1
G1
H1
A1
B1
01
02
03
04
05

THE BAY OF NAPLES and SEBAGO LAKE, MAINE

STORET NOS. 2314 and 2311

I. CONCLUSIONS

A. Trophic Condition:

Based on the data collected during the Survey, the Bay of Naples and Sebago Lake are considered to be oligotrophic. Personnel of the Maine Department of Environmental Protection concur in this assessment.

B. Rate-Limiting Nutrient:

The results of the algal assays indicate that phosphorus was limiting in both lakes at the time the assay sample was collected.

C. Nutrient Sources; Controllability:

1. Point Sources - The only point sources of nutrients that can affect the Bay of Naples and Sebago Lake are those impacting Long Lake just upstream in the Presumpscot River chain. Inclusion of phosphorus removal at the planned regional waste treatment facility at Long Lake would minimize the effect of the source on the Bay of Naples and Sebago Lake.

2. Non-Point Sources - Over 75% of calculated phosphorus and nitrogen loading to each lake comes from surface runoff. At present, septic tank contributions to both lakes are not believed to be significant. However, comparison of total P loading with the Vollenweider model suggest that slight increases may result in degradation in water quality. Thus, as lakeshore and watershed development progresses in response to increasing recreational needs, re-evaluation of diffuse sources should be made.

II. INTRODUCTION

The Bay of Naples (see map, page v) is situated between Long Lake and Sebago Lake in the upper Presumpscot River drainage system. The lake supports numerous kinds of fish, both cold- and warmwater species, and is a thoroughfare for many species moving between Long Lake and Sebago Lake. The lake has a high summer recreational use, including boating, swimming, and fishing.

Sebago Lake (see map, page vi) is the deepest lake in Maine and is situated at the end of the chain (Long Lake, Bay of Naples, and Sebago Lake). The lake is reported to be one of the most suitable lakes in the country for the management of salmon and is the home of the famed landlocked salmon, Salmo salar. Other fish species, such as smallmouth bass and whitefish, have recently gained popularity with the fisherman, and lake trout (Salvelinus namaycush) have been recently introduced.

Sebago Lake is the main source of the public water supply for the City of Portland, and is the largest single-source water supply in the State of Maine.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. BAY OF NAPLES:

1. Lake Morphometry:

   a. Surface area: 762 acres.

   b. Mean depth: 14 feet.

   c. Maximum depth: 44 feet.

   d. Volume: 10,668 acre/ft.

   e. Mean hydraulic retention time: 26 days.

2. Tributary and Outlet:
   (See Appendix A for flow data)

   a. Tributaries -

Name	Drainage area†	Mean flow†
Long Lake outlet	114.0 mi^2	194.8 cfs
Minor tributaries & immediate drainage -	3.8 mi^2	10.2 cfs
Totals	117.8 mi^2	205.0 cfs

   b. Outlet -

Songo River	119.0 mi^2*	205.0 cfs

3. Precipitation**:

   a. Year of sampling: 50.1 inches.

   b. Mean annual: 42.8 inches.

---

* Includes area of lake.
** See Working Paper No. 1, "Survey Methods".
† Drainage areas are accurate within ±1% and mean annual flows within ±5%.

B. SEBAGO LAKE:

1. Lake Morphometry:

   a. Surface area: 28,771 acres.

   b. Mean depth: 101 feet.

   c. Maximum depth: 316 feet.

   d. Volume: 2,905,871 acre/ft.

   e. Mean hydraulic retention time: 5.4 years.

2. Tributary and Outlet:
   (See Appendix A for flow data)

   a. Tributaries -

Name	Drainage area†	Mean flow†
Rich Mill Pond outlet	6.2 mi^2	11.0 cfs
Northwest River	22.0 mi^2	36.2 cfs
Muddy River	16.0 mi^2	27.5 cfs
Crooked River	153.0 mi^2	263.3 cfs
Songo River	119.0 mi^2	205.0 cfs
Thomas Pond outlet	5.3 mi^2	8.6 cfs
Panther Run - Panther Pond outlet	29.9 mi^2	46.4 cfs
Minor tributaries & immediate drainage -	44.6 mi^2	140.8 cfs
Totals	396.0 mi^2	738.8 cfs

* Drainage areas are accurate within ±1% and mean annual flows within ±5%.

Name	Drainage area†	Mean flow†
b. Outlet -		
Presumpscot River	441.0 mi^2*	738.8 cfs

3. Precipitation**:

   a. Year of sampling: 50.1 inches.

   b. Mean annual: 42.8 inches.

* Includes area of lake.
** See Working Paper No. 1, "Survey Methods".
† See preceding page.

IV. LAKE WATER QUALITY SUMMARY

The Bay of Naples and Sebago Lake were sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from stations on the lakes and from a number of depths at the stations (see maps, pages v and vi). During each visit a single depth-integrated (15 feet or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single five-gallon depth-integrated sample was composited from each lake for algal assays. Also, each time depth-integrated samples were collected at the stations for chlorophyll a analyses. For the Bay of Naples, the maximum depth sampled at the single station was 19 feet. The maximum depths sampled in Sebago Lake were 75 feet at station 1, 60 feet at station 2, 10 feet at station 3, 50 feet at station 4, and 8 feet at station 5.

It should be noted that the Survey Secchi disc values are consistently less than those observed by the Maine Department of Environmental Protection. Such variations could be attributed to fluctuations in cloud cover or sun angle (ambient light conditions), observer technique, water surface disturbance, or may, in fact, be the result of short-term water clarity differences.

The results obtained are presented in full in Appendix B; and the data for the fall sampling period, when the lake was essentially well-mixed, are

summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

1. BAY OF NAPLES -

FALL VALUES

(10/02/72)

Parameter	Minimum	Mean	Median	Maximum
Temperature (Cent.)	16.6	16.6	16.6	16.6
Dissolved oxygen (mg/l)	8.7	8.7	8.7	8.7
Conductivity (μmhos)	50	50	50	50
pH (units)	6.3	6.3	6.3	6.3
Alkalinity (mg/l)	10	10	10	10
Total P (mg/l)	0.007	0.009	0.009	0.012
Dissolved P (mg/l)	0.006	0.006	0.006	0.007
NO_2 + NO_3 (mg/l)	0.020	0.030	0.030	0.040
Ammonia (mg/l)	0.050	0.060	0.060	0.070

ALL VALUES

Secchi disc (inches)	96	126	126	156

2. SEBAGO LAKE -

FALL VALUES

(10/02/72)

Parameter	Minimum	Mean	Median	Maximum
Temperature	8.6	15.1	15.7	15.8
Dissolved oxygen	9.0	9.4	9.4	10.0
Conductivity	50	50	50	50
pH	6.3	6.8	6.8	7.0
Alkalinity	10	11	10	13
Total P	0.006	0.008	0.008	0.010
Dissolved P	0.005	0.007	0.007	0.009
$NO_2 + NO_3$	0.040	0.098	0.100	0.160
Ammonia	0.040	0.059	0.055	0.110

ALL VALUES

Secchi disc	60	199	216	288

B. Biological characteristics:

1. BAY OF NAPLES -

a. Phytoplankton* -

Sampling Date	Dominant Genera	Number per ml
10/02/72	1. Fragilaria	2,792
	2. Dinobryon	1,208
	3. Flagellates	1,208
	4. Anabaena	1,057
	5. Melosira	1,019
	Other genera	7,284
	Total	9,736

* The other phytoplankton samples were lost in transit.

b. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
06/08/72	01	1.7
08/07/72	01	1.9
10/02/72	01	1.9

2. SEBAGO LAKE -

a. Phytoplankton* -

Sampling Date	Dominant Genera	Number per ml
06/03/72	1. Asterionella	45
	2. Dinobryon	37
	3. Synedra	25
	4. Nitzschia	22
	5. Navicula	20
	Other genera	55
	Total	204
10/02/72	1. Dinobryon	397
	2. Flagellates	266
	3. Melosira	241
	4. Synedra	75
	5. Fragilaria	50
	Other genera	344
	Total	1,376

* The August phytoplankton sample was lost in transit.

b. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
06/03/72	01	1.0
	02	2.4
	03	1.4
	04	2.3
	05	2.7
08/07/72	01	2.0
	02	1.0
	03	0.9
	04	0.9
	05	1.6
10/02/72	01	1.3
	02	1.1
	03	1.1
	04	1.1
	05	1.5

C. Limiting Nutrient Study:

1. BAY OF NAPLES -

a. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.002	0.036	0.2
0.006 P	0.008	0.036	0.5
0.012 P	0.014	0.036	0.8
0.024 P	0.026	0.036	0.7
0.060 P	0.062	0.036	0.7
0.060 P+10.0 N	0.062	10.036	39.2
10.0 N	0.002	10.036	0.2

b. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, shows that the potential primary productivity of the Bay of Naples was relatively low at the time the sample

was collected. Also, the increasing yields with the increasing increments of orthophosphorus (up to about 0.014 mg/l) show that the Bay of Naples was phosphorus limited. At ortho-P concentrations higher than about 0.014 mg/l, however, yields do not increase until nitrogen is also added which indicates the lake would become nitrogen limited if ortho-P concentrations were increased beyond 0.014 mg/l. Note that the addition of only nitrogen produced a yield not significantly different than the control yield.

2. SEBAGO LAKE -

a. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.004	0.061	0.1
0.006 P	0.010	0.061	1.4
0.012 P	0.016	0.061	1.6
0.024 P	0.028	0.061	1.6
0.060 P	0.064	0.061	1.7
0.060 P+10.0 N	0.064	10.061	30.5
10.0 N	0.004	10.061	0.1

b. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, shows that the potential primary productivity of Sebago Lake was relatively low at the time the sample was collected. The yield did not increase significantly with increasing increments of orthohphosphorus until nitrogen was also added. At ortho-P concentrations higher than

about 0.010 mg/l, yields do increase significantly until nitrogen is also added which indicates the lake would become nitrogen limited if ortho-P concentrations were increased beyond 0.010 mg/l. Note that the addition of only nitrogen produced a yield not significantly different than the control yield.

D. Trophic Condition:

1. BAY OF NAPLES -

Based on Survey data, the Bay of Naples is considered oligotrophic. Dissolved oxygen ranged from 8.4 mg/l to 10.5 mg/l for all samples taken. Nutrient levels were low when compared to the other 1972 Survey lakes. When ranking the Bay of Naples with other 1972 Survey lakes on nutrient levels (i.e., total and dissolved phosphates and inorganic nitrogen) at least 98 percent of all the lakes had higher levels of the above nutrients. Chlorophyll a values were quite low with a range from 1.7 µg/l to 1.9 µg/l.

2. SEBAGO LAKE -

Based on the data collected during the Survey, Sebago Lake is considered oligotrophic. Dissolved oxygen ranged from 8.6 mg/l to 14.0 mg/l with a mean of 10.6 mg/l for all samples taken. None of the samples taken in the hypolimnion were below 10.0 mg/l.

Nutrient levels were very low, and the mean chlorophyll a level was 1.5 µg/l for all samples taken.

V. NUTRIENT LOADINGS*
(See Appendix B for data)

For the determination of nutrient loadings, from September, 1972, through August, 1973, the Maine National Guard collected near-surface grab samples from each of the tributary sites indicated on the maps (pages i and ii), except for the high runoff months of April and May when two samples were collected at most stations.

Through an interagency agreement, estimated flows for the year of sampling and a "normalized" or average year were provided by the Maine District Office of the U.S. Geological Survey for the tributary sites nearest the lakes*.

There are no sewage treatment plants impacting directly on the Bay of Naples or Sebago Lake.

In this report, tributary loads for both lakes were calculated using mean concentrations and mean flows. The loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) for the Bay of Naples were estimated using mean ZZ flows there and the mean concentrations in the Northwest River (Sebago Lake tributary) at station C-1. The ZZ loadings for Sebago Lake were calculated using mean ZZ flows there and mean concentrations in the Northwest River at station C-1.

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*Based on sampling frequency and variations in concentrations, single tributary loadings for gaged sites are believed to be within ±16% of the true value 67% of the time and within ±32% of the true value 95% of the time.

**Flow data reported by U.S.G.S. at Sebago Lake outlet for the last 10 years are within 6% error of the 85 year record. These data (Appendix A) are adjusted from 616.99 cfs to 738.8 cfs mean annual flow so that the mean annual inflow equals the mean annual outflow.

A. BAY OF NAPLES:

1. Annual Total Phosphorus Loading - Average Year -

a. Inputs -

Source	lbs P/ yr	% of total
(1) Tributaries (non-point load) -		
Long Lake outlet	3,060	88.2
(2) Minor tributaries & immediate drainage (non-point load)*-	200	5.8
(3) Municipal STP's -		
None	-	-
(4) Septic tanks** -	90	2.6
(5) Industrial -		
None	-	-
(6) Direct Precipitation* -	120	3.4
Total	3,470	100.0

b. Outputs -

Lake outlet - Songo River 2,820

c. Net annual P accumulation - 650 lbs.

* Estimated; see Working Paper No. 1, "Survey Methods".
** Estimated 147 dwellings w/in 100 yards of lake, including camps.

2. Annual Total Nitrogen Loading - Average Year -

a. Inputs -

Source	lbs N/ yr	% of total
(1) Tributaries (non-point load) -		
Long Lake outlet	173,660	87.5
(2) Minor tributaries & immediate drainage (non-point load)*-	13,990	7.1
(3) Municipal STP's -		
None	-	-
(4) Septic tanks** -	3,450	1.7
(5) Industrial -		
None	-	-
(6) Direct precipitation* -	7,340	3.7
Total	198,440	100.0

b. Outputs -

Lake Outlet - Songo River 268,370

c. Net annual N loss - 69,930 lbs.

* Estimate; see Working Paper No. 1, "Survey Methods".
** Estimated 147 dwellings w/in 100 yards of lake, including camps.

B. SEBAGO LAKE:

1. Annual Total Phosphorus Loading - Average Year -

a. Inputs -

Source	lbs P/ yr	% of total
(1) Tributaries (non-point load) -		
Songo River	2,820	13.8
Crooked River	6,220	30.5
Northwest River	780	3.8
Muddy River	650	3.2
Rich Mill Pond outlet	390	1.9
Panther Run - Panther Pond outlet	730	3.6
Thomas Pond outlet	150	0.7
(2) Minor tributaries & immediate drainage (non-point load)* -	3,050	14.9
(3) Municipal STP's -		
None	-	-
(4) Septic tanks** -	1,140	5.6
(5) Industrial -		
None	-	-
(6) Direct Precipitation* -	4,490	22.0
Total	20,420	100.0

b. Outputs -

Lake outlet 8,730

c. Net annual P accumulation - 11,690 lbs.

* Estimated; see Working Paper No. 1, "Survey Methods".
** Estimated 1800 dwellings w/in 100 yds of lake, including camps.

2. Annual Total Nitrogen Loading - Average Year -

a. Inputs -

Source	lbs N/ yr	% of total
(1) Tributaries (non-point load) -		
Songo River	268,370	22.2
Crooked River	242,580	20.1
Northwest River	49,740	4.1
Muddy River	27,390	2.3
Rich Mill Pond outlet	18,670	1.5
Panther Run - Panther Pond outlet	74,170	6.1
Thomas Pond outlet	13,560	1.1
(2) Minor tributaries & immediate drainage (non-point load)* -	193,470	16.1
(3) Municipal STP's -		
None	-	-
(4) Septic tanks** -	42,890	3.6
(5) Industrial -		
None	-	-
(6) Direct precipitation* -	277,180	22.9
Total	1,208,020	100.0

b. Outputs -

Lake Outlet 1,063,180

c. Net annual N accumulation - 144,840 lbs.

* Estimated; see Working Paper No. 1, "Survey Methods".
** Estimated 1800 dwellings w/in 100 yds of lake, including camps.

C. Mean Annual Non-point Nutrient Export by Sub-drainage Area:

1. BAY OF NAPLES

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
Long Lake outlet	27	1,523

2. SEBAGO LAKE

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
Songo River	24	2,255
Crooked River	41	1,585
Northwest River	35	2,261
Muddy River	41	1,712
Rich Mill Pond outlet	63	3,011
Panther Pond outlet	24	2,481
Thomas Pond outlet	28	2,558

D. Yearly Loading Rate:

In the following tables, the existing phosphorus loading rates are compared to those proposed by Vollenweider (1973). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

1. BAY OF NAPLES -

Units	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
lbs/acre/yr	4.6	0.9	260.4	loss
grams/m^2/yr	0.52	0.10	29.2	-

Vollenweider loading rates for phosphorus ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Bay of Naples:

"Dangerous" (eutrophic rate)	1.48
"Permissible" (oligotrophic rate)	0.74

2. SEBAGO LAKE -

Units	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
lbs/acre/yr	0.7	0.4	42.0	5.0
grams/m^2/yr	0.08	0.04	4.7	0.6

Vollenweider loading rates for phosphorus ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Sebago Lake:

"Dangerous" (eutrophic rate)	0.48
"Permissible"(oligotrophic rate)	0.24

E. Nutrient Controllability:

At this time, both the Bay of Naples and Sebago Lake are receiving phosphorus loadings at rates below those proposed by Vollenweider as "permissible" (i.e., an oligotrophic rate), but both lakes are threatened. For example, if phosphorus loadings to the Bay of Naples were increased by only 2 lbs/acre/yr, or

1,530 lbs/yr for the entire lake, the permissible limit would be reached. As for Sebago Lake, because of its much greater retention time, an increase of only 1.5 lbs/acre/yr (ca. 43,000 lbs/yr for the entire lake) would result in a phosphorus loading rate exceeding the permissible limit.

The only point sources of nutrients, other than septic tanks, that can affect the Bay of Naples and Sebago Lake are those impacting Long Lake just upstream in the upper Presumpscot River chain (see Working Paper No. 4). Inclusion of phosphorus removal at the planned regional waste treatment facility at Bridgeton would minimize the effect of the source on the Bay of Naples and Sebago Lake and prevent a dangerous increase in phosphorus loading rates.

At present, septic tank contributions to the Bay of Naples and Sebago Lake are not believed to be a problem. However, as lakeshore development around these lakes progresses in response to increasing recreational demands, these sources may become significant.

VI. LITERATURE REVIEWED

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Hinckley, William P., 1973. Personal communication (recreational activities; industrial inputs to the Bay of Naples and Sebago Lake). Dept. of Environmental Protection, Augusta.

Scott, Matthew, 1973. Personal communication (uses and trophic states of the Bay of Naples and Sebago Lake). Dept. of Environmental Protection, Augusta.

Vollenweider, Richard A., 1973. Input-output models. MS, Canada Centre for Inland Waters, Burlington, Ontario.

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2314 BAY OF NAPLES

TOTAL DRAINAGE AREA OF LAKE 119.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2314A1	114.00	190.00	150.00	401.00	436.00	21.00	32.00	47.00	32.00	89.00	206.00	400.00	335.00	194.80
2314B1	119.00	202.00	161.00	449.00	458.00	27.00	35.00	48.00	33.00	90.00	207.00	408.00	344.00	205.06
2314ZZ	4.88	12.00	11.00	48.00	22.00	5.60	2.60	0.70	0.50	0.90	1.30	8.50	8.90	10.18

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 119.00
SUM OF SUB-DRAINAGE AREAS = 118.88

TOTAL FLOW IN = 2461.00
TOTAL FLOW OUT = 2462.00

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2314A1	9	72	66.00	16	52.00				
	10	72	250.00	14	257.00				
	11	72	588.00						
	12	72	424.00	2	564.00				
	1	73	312.00	7	116.00				
	2	73	328.00	3	1240.00				
	3	73	1010.00	3	96.00				
	4	73	301.00	8	325.00	21	213.00		
	5	73	584.00	5	356.00	20	572.00		
	6	73	336.00	2	343.00				
	7	73	324.00	14	201.00				
	8	73	315.00	12	245.00				
2314B1	9	72	67.00	16	53.00				
	10	72	252.00	14	259.00				
	11	72	603.00	4	504.00				
	12	72	441.00	2	588.00				
	1	73	336.00	7	128.00				
	2	73	362.00	3	1340.00				
	3	73	1140.00	4	122.00				
	4	73	320.00	7	361.00	21	228.00		
	5	73	596.00	5	387.00	19	846.00		
	6	73	344.00	2	351.00				
	7	73	331.00	14	205.00				
	8	73	324.00	12	252.00				
2314ZZ	9	72	1.40						
	10	72	1.30						
	11	72	16.00						
	12	72	16.00						
	1	73	24.00						
	2	73	34.00						
	3	73	135.00						
	4	73	19.00						
	5	73	11.00						
	6	73	6.90						
	7	73	4.80						
	8	73	4.30						

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2311 SEBAGO LAKE

TOTAL DRAINAGE AREA OF LAKE 441.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2311A1	441.00	598.00	645.00	652.00	676.00	733.00	696.00	548.00	653.00	578.00	569.00	531.00	528.00	616.99
2311B1	6.24	12.00	8.00	18.00	32.00	17.00	7.70	3.10	2.20	2.80	4.10	12.00	13.00	10.99
2311C1	22.00	36.00	27.00	71.00	105.00	58.00	27.00	9.50	6.00	7.80	12.00	37.00	38.00	36.18
2311D1	16.00	27.00	18.00	36.00	76.00	55.00	24.00	10.00	6.80	7.10	11.00	27.00	32.00	27.50
2311E1	153.00	206.00	144.00	361.00	814.00	530.00	247.00	91.00	53.00	71.00	116.00	289.00	238.00	263.31
2311F1	119.00	202.00	161.00	449.00	458.00	27.00	35.00	48.00	33.00	90.00	207.00	408.00	344.00	205.06
2311G1	5.29	11.00	8.00	18.00	22.00	12.00	5.70	2.10	1.50	1.60	2.40	7.80	11.00	8.59
2311H1	29.90	55.00	44.00	101.00	119.00	68.00	35.00	12.00	7.40	8.70	13.00	42.00	52.00	46.39
2311ZZ	90.30	208.00	208.00	556.00	304.00	89.00	60.00	12.00	6.10	11.00	15.00	111.00	174.00	140.84

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 441.00
SUM OF SUB-DRAINAGE AREAS = 441.73

TOTAL FLOW IN = 8872.38
TOTAL FLOW OUT = 7407.00

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2311A1	9	72	811.00	16	819.00				
	10	72	819.00	14	818.00				
	11	72	815.00	4	794.00				
	12	72	802.00	3	806.00				
	1	73	811.00	7	819.00				
	2	73	820.00	3	819.00				
	3	73	819.00	4	831.00				
	4	73	798.00	7	781.00	21	781.00		
	5	73	1533.00	5	1470.00	19	1700.00		
	6	73	1069.00	2	805.00				
	7	73	1244.00	14	1390.00				
	8	73	825.00	12	831.00				
2311B1	9	72	4.40	16	3.50				
	10	72	4.00	14	4.40				
	11	72	23.00	4	17.00				
	12	72	24.00	3	29.00				
	1	73	24.00	7	12.00				
	2	73	24.00	3	72.00				
	3	73	51.00	4	9.70				
	4	73	27.00	7	29.00	21	22.00		
	5	73	34.00	5	22.00	19	48.00		
	6	73	21.00	2	21.00				
	7	73	21.00	14	13.00				
	8	73	19.00	12	14.00				

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2311 SEBAGO LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
231101	9	72	12.00	16	9.50				
	10	72	12.00	14	13.00				
	11	72	70.00	4	53.00				
	12	72	49.00	3	83.00				
	1	73	71.00	7	34.00				
	2	73	83.00	3	244.00				
	3	73	200.00	4	38.00				
	4	73	49.00	7	96.00	21	73.00		
	5	73	115.00	5	75.00	19	163.00		
	6	73	72.00	2	73.00				
	7	73	55.00	14	40.00				
	8	73	52.00	12	39.00				
231121	9	72	11.00	16	8.70				
	10	72	11.00	14	12.00				
	11	72	51.00	4	39.00				
	12	72	58.00	3	80.00				
	1	73	53.00	7	25.00				
	2	73	55.00	3	144.00				
	3	73	101.00	4	19.00				
	4	73	45.00	7	70.00	21	53.00		
	5	73	109.00	5	71.00	19	155.00		
	6	73	64.00	2	65.00				
	7	73	49.00	14	43.00				
	8	73	59.00	12	44.00				
231141	9	72	111.00	16	88.00				
	10	72	114.00	14	125.00				
	11	72	546.00	4	415.00				
	12	72	433.00	3	520.00				
	1	73	408.00	7	196.00				
	2	73	461.00	3	1320.00				
	3	73	1010.00	4	192.00				
	4	73	682.00	7	747.00	21	567.00		
	5	73	1050.00	5	682.00	19	1490.00		
	6	73	659.00	2	672.00				
	7	73	527.00	14	389.00				
	8	73	461.00	12	345.00				
231151	9	72	67.00	16	53.00				
	10	72	252.00	14	259.00				
	11	72	603.00	4	504.00				
	12	72	441.00	3	588.00				
	1	73	334.00	7	128.00				
	2	73	342.00	3	1340.00				
	3	73	1140.00	4	122.00				
	4	73	320.00	7	341.00	21	228.00		
	5	73	536.00	5	387.00	19	846.00		
	6	73	344.00	2	351.00				
	7	73	331.00	14	205.00				
	8	73	324.00	12	252.00				

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2311 SEBAGO LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2311G1	9	72	2.50	16	2.00				
	10	72	2.40	14	2.60				
	11	72	15.00	4	11.00				
	12	72	20.00	3	24.00				
	1	73	22.00	7	11.00				
	2	73	24.00	3	72.00				
	3	73	51.00	4	9.70				
	4	73	19.00	7	21.00	21	16.00		
	5	73	24.00	5	16.00	19	34.00		
	6	73	15.00	2	15.00				
	7	73	14.00	14	8.70				
	8	73	13.00	12	9.80				
2311H1	9	72	14.00	16	11.00				
	10	72	13.00	14	14.00				
	11	72	79.00	4	60.00				
	12	72	95.00	3	114.00				
	1	73	109.00	7	52.00				
	2	73	135.00	3	404.00				
	3	73	284.00	4	54.00				
	4	73	101.00	7	109.00	21	83.00		
	5	73	135.00	5	88.00	19	192.00		
	6	73	93.00	2	95.00				
	7	73	83.00	14	51.00				
	8	73	64.00	12	48.00				
2311Z7	9	72	17.00						
	10	72	15.00						
	11	72	210.00						
	12	72	207.00						
	1	73	412.00						
	2	73	636.00						
	3	73	1560.00						
	4	73	258.00						
	5	73	176.00						
	6	73	160.00						
	7	73	83.00						
	8	73	53.00						

APPENDIX B

PHYSICAL AND CHEMICAL DATA

K - Value is less than indicated
J - Value known to be in error

STORET RETRIEVAL DATE 74/06/25

231401
43 58 00.0 070 36 00.0
BAY OF NAPLES
23 MAINE

11EPALES
5

2111202
0020 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/08	14 55	0000	18.4	9.8	156	30	7.00	10K	0.050	0.010K	0.004	0.003
	14 55	0005	18.4	9.8								
	14 55	0010	18.3	9.8								
	14 55	0015	17.9	9.9		30	7.00	10K	0.050	0.020	0.003	0.002K
	14 55	0019	12.4	10.5		30	6.60	10K	0.050	0.020	0.003	0.002
72/08/07	14 40	0000	22.6		96	50K	6.70	10K	0.040	0.050	0.007	0.005
	14 40	0004		8.4		50K	6.70	10K	0.040	0.030	0.006	0.003
	14 40	0015	22.6	8.6		50K	6.60	10K	0.030	0.040	0.005	0.003
72/10/02	12 00	0000				50K	6.25	10K	0.020	0.050	0.012	0.007
	12 00	0004	16.6	8.7		50K	6.35	10K	0.040	0.070	0.007	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/08	14 55	0000	1.7J
72/08/07	14 40	0000	1.9J
72/10/02	12 00	0000	1.7J

STORET RETRIEVAL DATE 74/06/25

231101
43 46 00.0 070 31 24.0
SEBAGO LAKE
23 MAINE

11EPALES
3

2111202
0030 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/03	14 30	0000	11.5	11.9	260K	20	.90	10K	0.150	0.030	0.003	0.002K
	14 30	0010	8.8	13.4				10K	0.140	0.030	0.002K	0.002K
	14 30	0015	8.3	14.0				10K	0.140	0.030	0.003	0.002K
	14 30	0030	7.7	11.9		20	6.80	10K	0.140	0.020	0.003	0.002
72/08/07	17 55	0000			288	50K	6.70	10	0.100	0.040	0.003	0.003
	17 55	0004	21.3	9.2		50K	6.70	10K	0.110	0.060	0.003	0.003
	17 55	0015	16.6	10.0		50K	6.60	10K	0.130	0.050	0.004	0.004
	17 55	0022	13.4	10.8		50K	6.50	10K	0.140	0.050	0.004	0.003
	17 55	0035	11.2	11.6		50K	6.40	11	0.150	0.040	0.003	0.002
	17 55	0050	8.3	11.4		50K	6.40	11	0.150	0.040	0.005	0.003
	17 55	0075	7.2	11.2		50K	6.30	10	0.150	0.030	0.004	0.003
72/10/02	09 30	0000			276	50K	7.80	10K	0.100	0.060	0.009	0.009
	09 30	0004	15.7	9.6		50K	6.80	13	0.100	0.040	0.008	0.007
	09 30	0015	15.7	9.4		50K	6.80	12	0.100	0.050	0.007	0.008
	09 30	0025	15.7	9.1		50K	6.80					
	09 30	0030	15.7	9.4		50K	7.00	13	0.100	0.040	0.008	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/03	14 30	0000	1.0J
72/08/07	17 55	0000	2.0J
72/10/02	09 30	0000	1.3J

STORET RETRIEVAL DATE 74/06/25

231102
43 48 42.0 070 32 30.0
SEBAGO LAKE
23 MAINE

11EPALES 2111202
3 0050 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/03	15 10	0000	14.0	12.4	216	20	7.00	10K	0.130	0.050	0.002	0.002K
	15 10	0010	11.9									
	15 10	0015	10.3	12.9		20	7.00	10K	0.140	0.040	0.003	0.002K
	15 10	0025	7.5	13.8		20	6.90	10K	0.150	0.030	0.002K	0.002K
	15 10	0050	5.6	12.4		20	6.90	10K	0.140	0.030	0.002K	0.002K
72/08/07	17 25	0000			288	50K	6.70	11	0.100	0.030	0.004	0.004
	17 25	0004	21.2	8.8		50K	6.70	11	0.100	0.030	0.003	0.003
	17 25	0015	21.1	8.6		50K	6.60	10	0.100	0.020	0.004	0.003
	17 25	0022	21.0	10.2		50K	6.50	10	0.130	0.040	0.004	0.004
	17 25	0030	13.8	10.2		50K	6.40	10	0.120	0.030	0.004	0.002
	17 25	0035	9.9	11.2		50K	6.40	10K	0.150	0.040	0.003	0.003
72/10/02	10 00	0000			276	50K	6.80	10K	0.100	0.060	0.010	0.008
	10 00	0004	15.4	9.4		50K	6.75	10K	0.100	0.060	0.006	0.007
	10 00	0015	15.4	9.4		50K	6.80	10K	0.100	0.050	0.007	0.008
	10 00	0030	15.3	9.4		50K	6.70	10K	0.100	0.050	0.007	0.005
	10 00	0060	8.6	10.0		50K	6.35	10K	0.160	0.060	0.008	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/03	15 10	0000	2.4J
72/08/07	17 25	0000	1.0J
72/10/02	10 00	0000	1.1J

STORET RETRIEVAL DATE 74/06/25

231103
43 51 24.0 070 37 30.0
SEBAGO LAKE
23 MAINE

11EPALES 2111202
3 0012 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/03	15 50	0000	14.7	12.1	120	20	7.00	10K	0.110	0.010K	0.004	0.002K
	15 50	0010	13.3	11.3		20	7.00	10K	0.110	0.010	0.002K	0.002K
72/08/07	17 10	0000			168	50K	6.70	10	0.100	0.030	0.003	0.003
	17 10	0004	21.6	8.6		50K	6.70	10K	0.100	0.030	0.003	0.002
	17 10	0009	21.6	12.4		50K	6.60	10K	0.100	0.030	0.004	0.003
72/10/02	11 40	0000			144	50K	6.70	10K	0.120	0.100	0.007	0.008
	11 40	0004	15.8	9.4		50K	6.75	10K	0.100	0.050	0.006	0.007
	11 40	0008	15.8	9.5		50K	7.00	10K	0.100	0.070	0.007	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/03	15 50	0000	1.4J
72/08/07	17 10	0000	0.9J
72/10/02	11 40	0000	1.1J

STORET RETRIEVAL DATE 74/06/25

231104
43 53 24.0 070 28 42.0
SEBAGO LAKE
23 MAINE

11EPALES
3

2111202
0050 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/03	16 10	0000	17.4	10.9	146	20	7.10	10K	0.110	0.010	0.005	0.002
	16 10	0010	15.5	12.0		20	7.00	10K	0.110	0.010	0.003	0.002K
	16 10	0020	13.5	12.4		20	7.00	10K	0.120	0.010K	0.002K	0.002K
	16 10	0030	7.3	13.5		20	7.00	10K	0.140	0.010K	0.002K	0.002K
	16 10	0050	5.6	12.6		20	6.90	10K	0.140	0.010	0.002K	0.002K
72/08/07	16 00	0000			252	50K	6.70	10K	0.130	0.070	0.005	0.003
	16 00	0004	22.1	8.8		50K	6.70	10K	0.100	0.030	0.004	0.005
	16 00	0015	22.1	9.0		50K	6.60	10K	0.100	0.020	0.004	0.003
	16 00	0020	22.0	8.6		50K	6.60	10K	0.100	0.030	0.005	0.005
	16 00	0030	13.4	11.4		50K	6.40	10K	0.150	0.060	0.004	0.004
	16 00	0040	8.3	11.2		50K	6.40	10K	0.170	0.060	0.005	0.003
	16 00	0050	7.8	11.4		50K	6.40	10K	0.160	0.060	0.003	0.003
72/10/02	10 30	0000			276	50K	6.80	10K	0.120	0.110	0.009	0.009
	10 30	0004	15.7	9.4		50K	6.80	12	0.100	0.050	0.007	0.007
	10 30	0015	15.7	9.6		50K	6.70	10	0.100	0.050	0.008	0.005
	10 30	0031	15.3	9.2		50K	6.70	10	0.090	0.050	0.008	0.005

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/03	16 10	0000	2.3J
72/08/07	16 00	0000	0.9J
72/10/02	10 30	0000	1.1J

STORET RETRIEVAL DATE 74/06/25

231105
43 54 48.0 070 34 36.0
SEBAGO LAKE
23 MAINE

11EPALES
3

2111202
0006 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/03	18 50	0000	18.0	10.3	72	20	7.00	10K	0.100	0.010	0.003	0.002
72/08/07	16 40	0000			144	50K	6.70	10K	0.120	0.060	0.006	0.004
	16 40	0004	21.6	9.0		50K	6.70	10K	0.120	0.060	0.003	0.003
	16 40	0008	21.5	9.0		50K	6.60	10K	0.110	0.050	0.002	0.003
72/10/02	11 00	0000			60	50K	6.65	10K	0.040	0.060	0.010	0.006
	11 00	0004	15.5	9.0		50K	6.60	10K	0.040	0.060	0.008	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/03	18 50	0000	2.7J
72/08/07	16 40	0000	1.6J
72/10/02	11 00	0000	1.5J

APPENDIX C

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

K - Value is less than indicated
J - Value known to be in error

STORET RETRIEVAL DATE 74/06/25

2314A1 LS2314A1
43 58 00.0 070 56 00.0
LONG LAKE OUTLET
23 15 SEBAGO LAKE
T/BAY OF NAPLES
US 302 BRDG E OF NAPLES
11EPALES 2111204
4 . 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	12	20	0.043	0.300	0.056	0.005K	0.005K
72/10/14	10	45	0.050	0.150	0.059	0.005K	0.005K
72/12/02	11	30	0.020	0.450	0.014	0.005K	0.012
73/01/07	10	15	0.035	0.210	0.015	0.005K	0.005K
73/02/03	12	20	0.058	0.200	0.018	0.005K	0.005K
73/03/03	10	50	0.044	0.340	0.021	0.005K	0.010
73/04/08	13	20	0.069	0.120	0.011	0.005K	0.005K
73/04/21	14	15	0.061	0.210	0.005K	0.005K	0.005K
73/05/05	11	20	0.075	0.280	0.056	0.005K	0.005K
73/05/20	16	30	0.054	0.720	0.019	0.005K	0.005K
73/06/02	10	25	0.056	0.240	0.014	0.005K	0.010
73/07/14	11	15	0.048	0.280	0.030	0.005K	0.005K
73/08/12	13	20	0.011	0.250	0.023	0.007	0.015

STORET RETRIEVAL DATE 74/06/25

231481 2311F1
43 56 00.0 070 35 00.0
SONGO RIVER
23 15 SEBAGO LAKE
0/BAY OF NAPLES
BRDG W EDGE OF SONGO LK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	12 30		0.036	0.750	0.052	0.005K	0.005K
72/10/14	12 15		0.055	0.800	0.080	0.005K	0.005K
72/11/04	11 00		0.026	0.280	0.025	0.005K	0.006
72/12/02	09 30		0.022	0.460	0.015	0.005K	0.010
73/01/07	11 15		0.042	0.840	0.044	0.005K	0.006
73/04/07			0.067	0.350	0.011	0.005K	0.005K
73/04/21			0.069	0.270	0.012	0.005K	0.010
73/05/05			0.120	0.790	0.016	0.005K	0.005K
73/05/19			0.115	0.260	0.009	0.005K	0.010
73/06/02			0.052	0.200	0.008	0.005K	0.005K
73/07/14	09 45		0.048	0.840	0.022	0.005K	0.005K
73/08/12			0.015	1.470	0.052	0.009	0.010

STORET RETRIEVAL DATE 74/06/25

2311A1 LS2311A1
43 48 00.0 070 27 00.0
PRESUMPSCOT RIVER
23 15 GRAY
O/SEBAGO LAKE
WHITE ROCK ROAD CRSG NE OF N GORHAM
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	10 20		0.093	2.400	0.065	0.005K	0.008
72/10/14	09 00		0.110	0.200	0.054	0.005K	0.005K
72/11/04	09 15		0.112	0.520	0.048	0.005K	0.006
72/12/03	08 55		0.115	0.210	0.007	0.005K	0.005K
73/01/07	09 55		0.126	0.280	0.019	0.005K	0.006
73/02/03	10 35		0.132	0.440	0.033	0.005K	0.005
73/03/04	08 00		0.138	0.840	0.024	0.005K	0.005K
73/04/21			0.115	0.370	0.015	0.005K	0.005K
73/05/05			0.110	0.120	0.008	0.005K	0.005K
73/05/19			0.105	0.970	0.007	0.005K	0.005K
73/06/02			0.096	0.670	0.033	0.005K	0.005K
73/07/14	08 30		0.089	0.920	0.046	0.005K	0.005K
73/08/12			0.061	0.160	0.018	0.005K	0.010

STORET RETRIEVAL DATE 74/06/25

231181 LS231181
43 47 00.0 070 33 00.0
RICH MILL POND
23 15 SEBAGO
T/SEBAGO LAKE
OFF ST HWY 114 1.75 MI NW OF SEBAGO LAKE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 40		0.220	1.290	0.210	0.011	0.028
72/10/14	14 04		0.067	0.700	0.075	0.005K	0.020
72/11/04	11 35		0.059	0.660	0.060	0.007	0.021
72/12/03	12 00		0.039	0.480	0.058	0.005K	0.022
73/01/07	14 00		0.042	0.880	0.110	0.005K	0.025
73/02/03			0.075	0.520	0.054	0.008	0.030
73/03/04	13 00		0.084	0.970	0.105	0.005K	0.020
73/04/07			0.031	0.270	0.044	0.005K	0.010
73/04/21			0.025	0.460	0.020	0.005K	0.010
73/05/05			0.025		0.092	0.005K	0.010
73/05/19			0.110	0.280	0.012	0.005K	0.005K
73/06/02			0.010K	0.320	0.006	0.010	0.010
73/07/14	13 00		0.022	0.630	0.028	0.005K	0.015
73/08/12			0.060	0.945	0.036	0.006	0.025

STORET RETRIEVAL DATE 74/06/25

2311C1 LS2311C1
43 52 00.0 070 38 30.0
NORTHWEST RIVER
23 15 SEBAGO
T/SEBAGO LAKE
ST HWY 11 XING N OF E SEBAGO
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 16		0.056	0.482	0.060	0.006	0.014
72/10/14	13 22		0.098	1.300	0.140	0.005K	0.011
72/11/04	11 45		0.023	0.480	0.039	0.005K	0.012
72/12/03	11 45		0.020	0.370	0.014	0.005K	0.009
73/02/03			0.040	0.440	0.017	0.006	0.010
73/04/07			0.010K	0.250	0.013	0.005K	0.005K
73/05/05			0.014	0.165	0.014	0.005K	0.010
73/05/19			0.014	0.120	0.010	0.005K	0.005K
73/06/02			0.010K	0.310	0.006	0.010	0.010
73/07/14	12 00		0.025	1.800	0.105	0.005K	0.015
73/08/12			0.063	1.600	0.052	0.006	0.025

STORET RETRIEVAL DATE 74/06/25

231101 LS231101
43 55 30.0 070 37 00.0
MUDDY RIVER
23 15 SEBAGO
T/SEBAGO LAKE
ST HWY 11 BRDG IN S NAPLES
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 00		0.042	0.603	0.058	0.005K	0.013
72/10/14	12 45		0.130	0.500	0.115	0.005K	0.014
72/11/04	11 15		0.072	0.460	0.046	0.005K	0.016
72/12/03	11 00		0.063	0.420	0.027	0.005K	0.011
73/01/07	13 00		0.070	0.500	0.042	0.005K	0.007
73/02/03	13 00		0.046	0.390	0.022	0.006	0.006
73/03/04	12 00		0.078	0.920	0.036	0.005K	0.015
73/04/07			0.027	0.540	0.021	0.005K	0.010
73/04/21			0.021	0.150	0.012	0.005K	0.010
73/05/05			0.014	0.600	0.026	0.005K	0.010
73/05/19			0.105	0.140	0.010	0.005K	0.005K
73/06/02			0.010K	0.280	0.005K	0.009	0.015
73/07/14	10 45		0.016	0.520	0.016	0.005K	0.015
73/08/12			0.016	0.350	0.020	0.005K	0.015

STORET RETRIEVAL DATE 74/06/25

2311E1 LS2311E1
43 56 00.0 070 34 30.0
CROOKED RIVER
23 15 SEBAGO
I/SEBAGO LAKE
BRDG IN SONGO LOCK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	11 43		0.073	0.250	0.066	0.010	0.017
72/10/14	11 00		0.063	0.400	0.075	0.005K	0.013
72/11/04	10 40		0.045	0.290	0.036	0.005K	0.014
72/12/03	10 15		0.063	0.460	0.018	0.005K	0.011
73/02/03			0.050	0.650	0.023	0.005K	0.005K
73/04/07			0.044	0.420	0.037	0.005K	0.010
73/04/21			0.034	0.310	0.013	0.005K	0.015
73/05/05			0.110	0.260	0.013	0.005K	0.005K
73/05/19			0.110	0.130	0.006	0.005K	0.005K
73/06/02			0.021	0.260	0.007	0.010	0.015
73/07/14	10 05		0.067	0.440	0.037	0.005K	0.010
73/08/12			0.062	1.000	0.120	0.017	0.030

STORET RETRIEVAL DATE 74/06/25

2311G1 LS2311G1
43 54 30.0 070 31 00.0
THOMAS POND OUTLET
23 15 SEBAGO
T/SEBAGO LAKE
XING SSE OF S CASCO
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	11	24	0.036	0.780	0.063	0.005K	0.010
72/10/14	10	15	0.034	0.550	0.067	0.005K	0.009
72/11/04	10	15	0.016	0.460	0.030	0.005K	0.016
72/12/03	09	50	0.023	0.230	0.015	0.005K	0.010
73/01/07	10	45	0.030	0.540	0.032	0.005K	0.007
73/02/03	11	45	0.044	0.790	0.037	0.005K	0.005K
73/03/04	11	20	0.044	0.440	0.020	0.005K	0.005K
73/04/07			0.031	0.210	0.016	0.005K	0.010
73/04/21			0.028	0.230	0.012	0.005K	0.010
73/05/05			0.105	0.220	0.010	0.005K	0.015
73/05/19			0.110	2.200	0.086	0.005K	0.005K
73/06/02			0.010K	1.050	0.044	0.009	0.010
73/07/14	09	00	0.011	0.280	0.016	0.005K	0.005K
73/08/12			0.017	2.700	0.084	0.005K	0.010

STORET RETRIEVAL DATE 74/06/25

2311H1 LS2311H1
43 54 00.0 070 28 00.0
PANTHER RUN-PANTHER POND OUTLET
23 15 GRAY
T/SEBAGO LAKE
BRDG IN NE RAYMOND
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	11 05		0.053	0.967	0.080	0.008	0.012
72/10/14	09 45		0.036	0.800	0.067	0.005K	0.011
72/11/04	09 45		0.026	0.380	0.038	0.005K	0.011
72/12/03	09 22		0.021	0.630	0.015	0.005K	0.008
73/01/07	10 45		0.017	0.560	0.029	0.005K	0.006
73/02/03	11 55		0.024	0.720	0.031	0.005K	0.005K
73/04/07			0.023	0.320	0.048	0.005K	0.005K
73/04/21			0.014	0.480	0.097	0.005K	0.005K
73/05/05			0.110	0.420	0.015	0.005K	0.005K
73/05/19			0.110	0.100K	0.007	0.005K	0.005K
73/06/02			0.010K	0.520	0.024	0.009	0.010
73/07/14	08 30		0.014		0.069	0.005K	0.005K
73/08/12			0.011	1.600	0.054	0.005K	0.010